

Amazing American Corn: Why Produce Ethanol?

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Over the past two decades there has been a big reality check on finding an alternative fuel source other than oil – a fuel source that could be produced in our own country rather than importing from overseas; the production of ethanol has helped to provide a solution to this dilemma and has turned out to be an extremely important product for our economy. Six years ago, in 2005, more than 13 percent of the corn produced in the United States went towards creating ethanol. With the help of farmers to produce ethanol, this lessened United States dependence on foreign fuel and oil imports (Mosier 1). Ethanol is cleaner for the environment and has great positive impacts on both the economy and agricultural production. Today, we often hear the term “Going Green”, a phrase meant to promote environmental conservation and actions geared toward recycling, saving time, and saving money. Ethanol can help us do this.

To begin, you must be wondering what exactly is ethanol? Ethanol is an alcohol made by yeast from sugars. It is the same alcohol found in beer, wine and spirits. Fuel ethanol is ethanol that has been highly concentrated to withdraw water and it is blended with water to make the alcohol highly undrinkable. This fuel is one of the cleanest possible for the environment (Mosier 1). This product is enabling many Americans to save money because it is a cheaper source of fuel. Today, all cars and trucks can use gasoline and ethanol blends of up to 10 percent ethanol. This type of fuel is most commonly known as E10. Another blend, known as E85, is up to 85 percent ethanol and can be used for fuel for cars and trucks with just the slightest modifications, for approximately \$100.00 per vehicle (Mosier 1). These modifications would enable the vehicles to use gasoline or ethanol blends, and would be a huge money saver for any American patron.

Secondly, ethanol is made from plants, usually corn, and is a renewable fuel source. With 124 ethanol plants now operating in the United States and about 76 more under way, the industry

is quickly growing ("Why Ethanol?" 1). Ethanol can help America win energy independence and will help protect our environment in many different ways. First, it will lessen dependence on foreign oil. Currently, 60 percent of the oil used in United States gasoline comes from countries other than the United States ("Why Ethanol?" 1). President Bush once quoted "Our dependence on foreign fuel is like a foreign tax on the American Dream and that tax is growing every year" ("Why Ethanol?" 1). Secondly, if more ethanol was produced it would also help reduce pollution. After all, it is a clean burning fuel. In fact, ethanol cuts greenhouse gas emissions by 18 to 29 percent a gallon according to the United States Office of Energy and Efficiency and Renewable Energy. With the help of this renewable fuel, the use of four billion gallons of ethanol in 2005 reduced greenhouse emissions by 7.8 tons. This is the equivalent of taking 1.2 million American cars off the roads! ("Why Ethanol?" 2):

Ethanol is literally a miracle fuel that could become the solution to many of our energy problems! With the help from former President Bush, a bill was proposed in 2005 to reduce gasoline use by 20 percent over the next decade. His goal – to produce 35 billion gallons of domestically produced ethanol and or alternative fuels by 2017. ("Why Ethanol?" 2). Also, with the help of top automotive companies such as Ford, General Motors, and Chrysler, 50 percent of their new vehicles are flex-fuel vehicles, (vehicles that can run on gasoline or ethanol), and are now powered by E85 capability as of 2010. NASCAR Racing has also participated in "going green" by having all 33 cars in the Indy 500 use 100 percent ethanol in their gas tanks. One driver from this event quoted "It's a green fuel that improves mileage by 30 percent, which allows for a smaller fuel tank." ("Why Ethanol?" 2). Not only are former presidents, top American companies, and NASCAR participating in ethanol use and production, but Microsoft creator Bill Gates, as well. Gates invested in Pacific Ethanol to help fund the construction of an

ethanol plant in Madera County, California. ("Why Ethanol?" 3). With the help of many, ethanol will be our next stable fuel source for America.

Last year, 86 percent of American grown corn was grown with genetically modified seed. About 40 percent of this was converted into ethanol (Gustin 1). According to the United States Department of Agriculture (USDA) 2010 report, 12.45 billion bushels of corn were produced (Schroeder 3). This was the third largest crop in United States history. It is estimated that by 2015, the United States must grow about 15 billion bushels a year to meet the needs for food, feed, exports and biofuel. That's more than six billion bushels from a decade ago. It will take about 90 million acres (Logue, Personal Interview). The same approximate acreage that farmers planted in the 1930's and 1940's . . . before the hybrid varieties (genetically produced seed), improved pesticides, and fertilizers propelled per acre yields skyward, to grow this amount of corn (Logue, Personal Interview).

Today, many place blame on farmers for giving corn that could be used as food, up for fuel use. This is not true however; there is still plenty of food for the population, including corn. In fact, twenty years ago, farmers were raising about 100 bushels of corn per acre. Today, because of new technology, such as fertilizer and genetically modified seed, farmers are raising about 158 bushels an acre (Blume 31). Instead of placing blame, we should all be investing in new technologies that will help farmers in developing new ways to improve our nation's productivity. CEO of Growth Energy Tom Buis, stated "While the yearly report is smaller than expected, it is still the third largest crop on record and that proves once again the tremendous capability of American farmers to meet our growing demand for food, feed, and renewable fuel – even during challenging growing conditions. There is plenty of potential to produce more, both

here in the United States and worldwide. American farmers have shown time and time again their ability to meet the demands of the marketplace" (Schroeder 2).

It is also worth noting that no part of the corn goes unused after it is processed for ethanol. Known as "distillers", this byproduct is then shipped to livestock farms where it is used as feed, leaving no waste, and proving once again what an important and multi-purpose crop American corn is ("Ethanol Production 101"). According to USDA reports, each pound of corn leftovers has 122 percent of the nutrition that is found in a pound of corn and soy meal blend. In producing ethanol, starch is removed from corn, leaving it richer in protein, oil, fiber, and phosphorus, making great nutritional feed for cattle, dairy cows, hogs, and poultry. Because of this, corn byproducts have now topped soymeal as the country's second-leading feed product (Logue, Personal Interview). In fact, according to USDA reports, soymeal has slipped from 14 percent to less than 13 percent of livestock feed in the past decade, and are expected to compete even more in livestock rations. Distillers are expected to top 18 percent of all United States feed use in 2012, up five percent from just a decade earlier. Domestic consumption has quadrupled to about 39 million metric tons (mmt) (Logue, Personal Interview). The grains are more digestible and beneficial, depending on animal maturity. Dairy cows, for example, could use 30 percent distillers and grains in their rations, compared with eight percent now. Mature sows... 50 percent versus the usual 10 percent. USDA anticipates a huge future demand of this product, also stating that these byproducts have flooded into the export markets. Exports have doubled since 2008 as livestock owners in Mexico, China, Vietnam, South Korea, and over 30 other nations clamor for more of these grains (Logue, Personal Interview).

A large percentage of ethanol's value lies in the fact that ethanol is a transportation fuel. The transportation department is where most oil is consumed. Sources like planes, cars, ships,

trucks, trains and pretty much everything that moves all depend on oil for fuel. Commodity manager Jerry Logue of Western New York Energy stated that, "Because oil is so viable, other alternative sources are very difficult to come by. Widely used sources such as coal, natural gas, and uranium are used as well. However, currently the only way to use these nonpetroleum primary energy sources in the transportation department is to use them with the production of ethanol" (Louge, Personal Interview). Because of this issue, the Energy Policy Act of 2005 was put into effect. The act mandated an increase in the amount of renewable transportation fuel used each year. Currently, nearly one-third of our nation's corn crop is used for making ethanol (Louge, Personal Interview). So what does this mean for our country? It means that five billion bushels of corn this year alone will be used for ethanol production ("Western New York Energy" 2). This number will only continue to increase and overall will help the growth of our economy.

With the mandated act in mind and the creation of ethanol being produced every day, how exactly is ethanol produced? Ethanol is the cleanest burning fuel our country has today – from the feedstock to the fuel stock (Freudenberger 206). The process begins with ground corn and grain in bin storage. Afterwards, the process of shredding, grinding, or mashing gives the fine meal grind that is needed to start the breakdown of starches. A conveyer chute then transfers all the material to a rotation mixer. This includes a set of scales where weight measurements are recorded. After this, grain is transferred to several machines where cooking and fermentation processing occur over a period of time. Fermentation occurs in 1,250 gallon machines. It takes approximately three and a half days for the fermentation process to be completed. Next, is the liquification process which takes place in a big tank called the slurry tank. The sugars from the liquification convert to make ethanol production possible. The distillation process then occurs. This process functions through the difference in boiling points between alcohol and water. Thus,

because of the higher vapor point of alcohol, ethanol evaporates faster than water when the mixture is boiled. This results in the vapors containing an uneven large share of ethanol. After the completion of this environmentally friendly process, ethanol is then finally created and is then transferred to the fuel stocks (Freudenberger 208).

Although, ethanol can be made from a variety of feedstock such as corn, sugarcane, barley, potatoes, sweet potatoes, sugar beets, and basically any source that contains sugar or starch – corn and sugarcane remain to be the top two sources that are used largely in the production of ethanol (Tabak 64). In our own country, corn is used because it is the least costly way to produce such large quantities of starch. Brazil, the second largest country to produce ethanol, produces it mainly off of sugarcane. Today, these two nations produce nearly 70 percent of all the ethanol manufactured in the world. However, 97 percent of ethanol is produced from corn in the United States – and look, we're all still alive (Freudenberger 208). And we have yet to run out of corn – how about that one folks?

There are two environmentally friendly ways to manufacture ethanol fuel. These ways are most commonly known as dry milling, which is the most common, and wet milling. Nearly five years ago, roughly 82 percent of all ethanol production was produced in dry mills (Tabak 64). Dry mills are the most commonly used because they are cheaper to construct and they reduce investor risk. These lower prices enable small town farmers to construct their own plants. On average, dry milling produces 2.75 gallons of ethanol and 17 pounds of DDGS for each bushel of corn produced (Tabak 65).

The wet milling process is much more involved. Really, the main difference between dry and wet milling is the crucial step that occurs in the beginning of the process after the corn has

been washed. The result of wet milling is 1.8 pounds of corn oil, 2.65 pounds of gluten corn meal, as well as 2.65 gallons of ethanol for each bushel of corn produced (Tabak 66).

With these facts in mind, I ask you, why? Why is there such a huge controversy towards ethanol production? What harm is it causing and why don't we as American citizens, stop disowning it and start demanding our political leaders do more to promote this great fuel for America. In fact, if a quarter, just one quarter, of the nation's gasoline could be replaced by ethanol, it would greatly reduce both oil prices and global warming emissions (Doeden 97). Turn on the news, read the paper, listen to the radio – every day there is someone speaking the issue of a cleaner America. This could be so simple, if we encourage ethanol production in our country.

Not only is ethanol helping to make our country more environmentally friendly but, it is increasing careers and economic growth in what has been a hard financial downfall for many Americans. In the early 2000's many Mid-Western communities built ethanol plants (Doeden 104). Those plants have offered and provided higher paying careers and much economic growth to rural areas that had been depressed economically. With an approximate cost of 60 million dollars for one year of construction towards an ethanol plant, it widens the local economic base by nearly 110 million dollars every year (Doeden 104). You see, plants rely on different sources to bring sources for ethanol in. This could be as simple as a truck, a barge, or railroad lines. What do all of these have in common? A driver. A driver who is supplied with a job; the crop that is in that cart is loaded by several people, which provides them with a job; people to unload that cart are provided with yet again a job; the farm where the crop came from yet again, providing a job, the plant where ethanol is being produced from that crop, thousands of jobs. It's a huge process that many do not realize but look at how much goes into everything and how one little thing can



provide for so many. For just one ethanol plant location approximately 700 permanent jobs will be created in the area (Doeden 104). I ask you, how could this not be helping the economy?

With this, more United States fuel sources need to be produced in our own country! Currently, the United States is producing less than half the oil they produced in 1970 (Friedman 17). What does this mean? It means we're traveling into West Africa and Russia to drill fuel for our own country, a country in which we are clearly capable of drilling in. Oil production from Alaska and the North Sea of Europe is declining greatly. The United States has burned more than a third of a trillion barrels of irreplaceable oil (Friedman 19). However, this is no need for our country to panic. With the small amount of ethanol we already produce, it already eliminated the need to import 170 million barrels of oil. On a yearly basis, an ethanol plant processes approximately 20 million barrels of irreplaceable oil (Baker 1). This, in today's society, is a huge economic help. It should also be noted that at the end of 2011 all subsidies for ethanol promotion and expansion provided by Congress will come to an end, and ethanol will be a totally self sufficient, American made product not relying on the American taxpayer for support (Logue, Personal Interview).

In conclusion, the production and use of ethanol can greatly impact our economy. Not only will it give us an alternative fuel source, but a fuel source that American's can afford. With the help of American farmers and American's creating ideas to advance their software, it will greatly impact America. Ethanol as a solution to American fuel will significantly benefit all of America for generations to come. Ethanol has and will continue to help decrease drilling oil from overseas. For once, we will finally be able to say we have something "American Made" or better yet, "Made in the USA". It will not only provide a great alternative fuel, but also thousands of jobs and wealth across the country ("Energy Efficiency and Renewable Resources" 2). Is this not

what our government and society push for? A stronger country – a stronger America? Ethanol can help us do this; all it takes is one step at a time to start pushing towards a better future.

Good Conclusion  
Good Bob in agreement

**Let The American Farmers Do What Is Best For America**

**“When the left doesn’t even know what is best.”**

**Grown In America**

**Made In America**

**And**

**Used In America**

**Let’s Make America Great Again.**

**Let’s get Government and EPA out of Americas Agriculture**

**Bob Brace**

**Katie is the granddaughter of Robert Brace**

Works Cited

- Baker, Allen. "The Economics of Food, Farming, Natural Resources and Rural Areas." *Amber Waves Mag.*, Apr. 2006. Web. 18 Oct. 2011. <[www.amberwaves.org](http://www.amberwaves.org)>.
- Blume, David. *Alcohol Can Be A Gas*. Santa Cruz, CA: First Printing, 2007. Print.
- Doeden, Matt. *Green Energy: Crucial Grains or Economic Strains?*. Minneapolis: Twenty - First Century Books, 2010. Print.
- "Energy Efficiency and Renewable Energy" *U.S. Department of Energy*. Ethanol Production, 2006. Web. 17 Oct. 2011. <<http://www.ethanol.org>>.
- Ethanol Production 101 - From the Field to the Fuel Pump*. BBI International and IBT Media. Hense, 2003. DVD.
- Freudenberger, Richard. *Alcohol Fuel*. Gabriola Island, BC VOR 1X0, Canada: New Society Publishers, 2009. Print.
- Friedman, Lauri. *Energy Alternatives*. Detroit: Thomas Gale, 2006. Print.
- Gustin, Georgina. "Farmers get OK to Plant Corn Produced Strictly for Ethanol." *St. Louis Post - Dispatch* 9 Sep. 2011. Print.
- Logue, Jerry, Commodity Manager. Personal Interview. 3 Oct. 2011.
- Mosier, Nathan. "How Fuel Ethanol is Made From Corn." *Bioenergy*. 2011: 1-4. Purdue University. Web. 15 Sep. 2011. <<http://factsonfile.com>>.
- Schroeder, Joanna. "Ethanol Industry Responds to Corn Harvest Report." *Stand Up for Agriculture: Support Ethanol, A Domestic Fuel*. 12 Jan. 2011. Web. 9 Sep. 2011. <<http://domesticfuel.com>>.
- Tabak, John. *Biofuels*. New York: Infobase Publishing, 2009. Print.
- Western New York Energy LLC*. 2004. Web. 19 Oct. 2011. <<http://www.wnyenergy.com>>.
- "Why Ethanol? - Energy is the Future - Ethanol is the Bridge". 2011. Web. 9 Sep. 2011. <<http://www.usecorn.com>>.

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Senior Research Paper Grading Rubric

	25-23 Points	22-21 Points	20-18 Points	17-16 Points	15-0 Points
Grammar	Grammar and sentence structure are well developed, there are few to no errors. It is obvious the paper has been reviewed thoroughly.	The paper has some mistakes in grammar and required extra reviewing before completion.	The paper has grammar errors throughout the majority and needed to be reviewed and corrected before completion.	The paper has an excess of errors in grammar and was rushed. The paper needs much improvement and should have been looked at closer before completion.	Little to no time was put into reviewing the paper. Errors in grammar throughout the entire paper.
Punctuation and Spelling	There are little to no errors in spelling. Punctuation is used properly.	There are no spelling errors. There are few punctuation errors.	There are less than three spelling errors and there are few punctuation errors.	There are more than 5 spelling errors and, the punctuation in the paper needs much improvement.	The spell check appears to not have been used, and the punctuation looks as though it was not proofread.
Content	There is information from all 10 sources. The content is organized and makes a point. The information given steers the audience to agree with your paper.	There is information from 9 sources. The content makes a point, but could be organized better. The information given steers the audience to agree with your paper.	There is information from 8 sources. The content makes a point, but could be organized better. The information given lacks strong points to fully convince your audience.	There is information from 7 sources. The content makes a weak point, and lacks organization. The information given does not clearly convince your audience.	There is information from 6 or less sources. The content makes a weak point and is disorganized. The information given does not persuade your audience.
Works cited page and Citations	There are at least 10 sources. There are at least 5 different types of sources. Sources are cited properly.	There are at least 9 sources. There are at least 5 different types of sources and sources are mostly cited properly.	There are at least 8 sources and 4 different types, at least 5 of the sources are cited properly.	There are at least 6 sources and 3 different types of sources. At least half of the sources are cited properly.	There are less than 5 sources, and less than 3 different types of sources. Most of the sources are not cited properly.
Format and Title Page	The paper is properly formatted. There is a heading and page numbers. The title page is spaced appropriately. The works cited page is set up according to MLA standards. The paper is 8-10 pages.	The paper is properly formatted. There are headings but spacing or the works cited pages are not set up properly. The paper is 8-10 pages in length.	The paper's format is mostly correct. The headings, spacing, or works cited page are not set up properly. The paper is 7-8 pages in length.	The paper is incorrectly formatted. The headings, spacing, or works cited page are incorrect. The paper is 6-7 pages.	The paper is under 6 pages; the format, works cited, and title page are incorrectly formatted.
Uniformity of paper Introduction, Conclusion, and Transitions	There is a solid attention getter. The thesis statement is one sentence including at least 3 major aspects of the paper. The introduction and conclusion both summarize the paper. There are transitions present between each paragraph.	The conclusion, and introduction are strong but the transitions could use a little work to tie the paper together.	One of the conclusion, the introduction, or transitions are weak and could have used more work tying the paper together.	Two of the three parts are weak and needed to be stronger to tie the paper together as a whole.	The introduction lacks an attention getter, the introduction and the conclusion do not sum up the idea of the paper and the transitions are not present.

*Great job 180/180*