**BEST Plots Energy Exercises**

**1.** A British thermal unit (**BTU**) is defined as the amount of heat required to raise the temperature of one pound of water by one degree Fahrenheit (Wikipedia).

**A.** One gram of switchgrass yields 16.18 BTUs of energy (use 16 if easier). The average biomass from the BEST Plots is 298.8 grams per square meter (g/m2). (In other words, every 1 X 1 meter area of the BEST Plots produced, on average, 298.8 grams of biomass.) How many BTUs could the average BEST plot produce per square meter?

**B.** Now pick your school and see how it compares to the average (if there are two entries for your school, either pick one, or average them). How many BTUs/m2 could your school produce?

**2.** When we think of producing biofuels, we think of planting them by the **acre** not be the square meter.

**A.** One acre is equal to 4,047 square meters. How many BTUs would the average BEST Plot produce per acre?

**B.** We normally measure energy, not in BTUs, but as **kilowatt-hours**. There are 3,412 BTUs in every kilowatt-hour of electricity. How many kilowatt-hours of electricity would the average BEST Plot produce on every acre?

**3.** In 2009, Michigan consumed 2,697,000,000,000 (2.7 trillion) BTUs of energy. At the average BEST plot productivity of 298.8 g/m2, we would need 220,363 acres of land to produce that much energy. 220,363 acres is equal to 2.2% of all of Michigan’s current agricultural land.

**A**. Find your school on the table (under the column labeled “% of Michigan’s Ag Land’). What percentage of Michigan’s agricultural land would be required at your school’s level of productivity (if there are two entries for your school, either pick one, or average them)?

How much agricultural land would be left for agricultural uses at your school’s level of productivity?