

HEATING THE MIDWEST

APRIL 10, 2017

BIOMASS UPDATE FOR 2016-17

- PRODUCTION UPDATES
- EVOLVING MARKETS
- HEIZOMAT MULTI-FUEL BIOMASS BOILER
INSTALLED AT UNIVERSITY OF ILLINOIS



GREEN FLAME ENERGY

FIELD TO FLAME BIOMASS SERVICES

PROFITABILITY OF AVAILABLE CROPS AND RESIDUES IN EAST CENTRAL ILLINOIS

	Corn	Soybeans	MxG Full Prod.	Switchgrass Full Production	Corn Stalks	Cobs
Yield bu or dry tons/acre	195	62	7.5	5.4	1.00	0.54
Price/bu - ton, Farm Gate	\$ 6.00	\$ 14.50	\$ 85	\$ 85	\$ 25	\$ 85
Other Payments	\$ -	\$ -				
Income	\$ 1,170	\$ 899	\$ 638	\$ 459	\$ 25	\$ 46
Fertilizer	\$ 122	\$ 63	\$ 34	\$ 30	\$ 21	\$ 5
Chemical	\$ 63	\$ 71	\$ -	\$ -	\$ -	\$ -
Seed	\$ 145	\$ 60	\$ 50	\$ -	\$ -	\$ -
Power, Equip	\$ 96	\$ 80	\$ 87	\$ 156	\$ -	\$ 15
Strg, Drying, Bldg	\$ 44	\$ 9	\$ 15	\$ 9	\$ -	\$ 3
Labor paid and unpaid	\$ 56	\$ 56	\$ 30	\$ 25	\$ -	\$ 16
Misc, Ins, Interest	\$ 61	\$ 48	\$ 26	\$ 24	\$ -	\$ 4
Land Rent	\$ 275	\$ 275	\$ 225	\$ 225	\$ -	\$ -
Expense	\$ 862	\$ 662	\$ 466	\$ 468	\$ 21	\$ 43
NET / ACRE	\$ 308	\$ 237	\$ 171	\$ (9)	\$ 4	\$ 3



PROFITABILITY OF AVAILABLE CROPS AND RESIDUES IN EAST CENTRAL ILLINOIS

	Corn	Soybeans	MxG Full Prod.	Switchgrass Full Production	Corn Stalks	Cobs
4/7/2017						
Yield bu or dry tons/acre	210	67	7.5	5.4	1.00	0.54
Price/bu - ton, Farm Gate	\$ 3.60	\$ 9.25	\$ 85	\$ 85	\$ 25	\$ 85
Other Payments	\$ -	\$ -				
Income	\$ 756	\$ 620	\$ 638	\$ 459	\$ 25	\$ 46
Fertilizer	\$ 122	\$ 63	\$ 34	\$ 30	\$ 21	\$ 5
Chemical	\$ 63	\$ 71	\$ -	\$ -	\$ -	\$ -
Seed	\$ 145	\$ 60	\$ 50	\$ -	\$ -	\$ -
Power, Equip	\$ 96	\$ 80	\$ 87	\$ 156	\$ -	\$ 15
Strg, Drying, Bldg	\$ 44	\$ 9	\$ 15	\$ 9	\$ -	\$ 3
Labor paid and unpaid	\$ 56	\$ 56	\$ 30	\$ 25	\$ -	\$ 16
Misc,Ins, Interest	\$ 61	\$ 48	\$ 26	\$ 24	\$ -	\$ 4
Land Rent	\$ 275	\$ 275	\$ 225	\$ 225	\$ -	\$ -
Expense	\$ 862	\$ 662	\$ 466	\$ 468	\$ 21	\$ 43
NET / ACRE	\$ (106)	\$ (42)	\$ 171	\$ (9)	\$ 4	\$ 3



EXTENDING THE CRP FILTER STRIP AND SQUARING OFF THE CORN FIELD





THE COST OF ESTABLISHING AN ACRE OF MISCANTHUS HAS STAYED RELATIVELY THE SAME AT **\$900/AC**, BUT THE NUMBER OF RHIZOMES HAS GONE UP EXPONENTIALLY FROM **6000/AC** TO **40,000/AC**

50 LBS OF NITROGEN DOUBLED YIELD



THERE IS STILL MUCH WE DON'T UNDERSTAND



AME ENERGY

APPARENT DAMAGE WHERE SNOW COVER WAS LACKING





HARVESTING IS WITH LARGE EFFICIENT EXISTING EQUIPMENT

**BAGGING COSTS ABOUT
\$20/TON (10FT BAG)**



COST TO MOVE ONE TON OF DRY MISCANTHUS FROM STANDING CROP TO FLAME - BALES vs CHIPS

Large Square Baler

Mow & Windrow \$2.00

Baled & Stack in field (3x4x8 1200 lbs) \$26.00

Load truck with forklift - \$50/hr \$ 1.00

Haul **25 tons** - 50 miles-\$6.00/loaded mile **\$12.00**

Unload bales to storage – forklift \$ 1.50

Move bales to grinder – forklift \$ 1.00

Destring & Grind \$12.00

Move chips to storage \$ 0.25

Convey to boiler \$ 0.25

Total Cost for Fuel Chips \$56.00

Silage Chopper

Chop & Stack at end of field \$ 10.00

Load truck with end loader - \$50/hr \$ 1.00

Haul **15 tons** - 50 miles-\$6.00/loaded mile **\$20.00**

Unload walking floor truck to storage \$0.25

Convey to boiler \$ 0.25

Total Cost for Fuel Chips \$31.50

Pelletizing would add \$20-\$30 a ton to either method.





LEARNING TO HANDLE FUEL CHIPS



OUR BEST MARKET TODAY – TURKEY BEDDING



ASIAN CARP + MISCANTHUS = NATURAL FERTILIZER



1 DRY TON OF BIOMASS = 170 GALS OF LP GAS





CONVERTED POLE BARN



HEIZOMAT BOILER ARRIVES
FROM GERMANY



2000 GAL THERMAL STORAGE
ARE TANKS PLACED FIRST

Fuel chips infeed conveyors and air lock.



<http://heizomat.co.uk/>

SOPHISTICATED BOILER CONTROLS



OPTIONAL FLY ASH CONTROL





APPLICATIONS REQUIRING 200 KW PLUS (650,000 BTU'S) WORK BEST



LOCAL – DIVERSIFIED – SMALL