Financial Resources For Local Producers

Assistance programs to help Pennsylvania growers transition into biomass energy crops

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Fundamental Economic Questions

- Biomass crop establishment costs?
- Biomass crop harvest costs?
- Biomass crop revenues?
- Who can help bridge the gap?

Biomass Crop Establishment Cost Two Data Sets

- Farm-Scale Production Cost Of Switchgrass For Biomass
  - Perrin, Vogel, Schmer, Mitchell - University of Nebraska - 2008 Publication
  - Five years, ten sites
  - An extremely thorough analysis
- Fifth Estate Growers
  - From Andy Bater's farm records
  - One site, two years, so far…

Switchgrass Establishment Cost[1]

- Nebraska-USDA Report
  - $89.18 per acre [2,3,4,5]
- Duffy Report
  - $136.61 per acre [2,3]
- Epplin Report
  - $116.12 per acre [2,3]
- Hallam Report
  - $180.32 per acre [2,3]
- Fifth Estate Growers
  - ~ $240 per acre [6]

[1] Land clearing and rental or other costs not included. No fertilizer.
[2] From Farm Scale Production Cost of Switchgrass For Biomass Table 11
[3] Note original establishment year costs of Seed-Materials-Machinery & Labor converted to acres with 2003 - 2008 CPI adjustment (1.19).
[4] Only 3 of the 10 sites in the Nebraska-USDA report required glyphosate for establishment.
[5] The Nebraska-USDA report calculates out to an average seed price per acre of $26.40 (adjusted to 2008 CPI).
[6] Herbicide (glyphosate) burn down, seed – $80 per acre, custom operator with no till drill, herbicide (2, 4 D & dicamba) for perennial weed control

Switchgrass Establishment vs. Yield

- Let's use $200 per acre establishment cost
- Divide by a hopeful 4 tons per acre
  - Typically at the end of the second (or third) year
- *So establishment cost is ~ $50 per ton*
  - Ignoring land rental and other charges

Biomass Harvest Cost

- Mowing - $10.00 - $19.00 per acre
- Raking - $5.00 - $11.00 per acre
  - *Let's call that $20 per acre or $5 a ton*
- Baling - $5.00 - $9.00 per 600 – 1,200 lb large round bale
  - *Let's round to $7.00 per 1000 lb bale*
  - *$3.50 a ton*
- Total farm gate harvest cost = $8.50 ton

From: http://www.nass.usda.gov/Statistics_by_State/Pennsylvania/Publications/Machinery_Custom_Rates/custom09.pdf

Biomass Purchase Price - Assumptions

- POET reportedly willing to pay $30 - $60 ton for corn cob biomass[1]
- Poor quality (mulch) "hay" auction = $40 - $50 ton[2]
- *So let's use $45 ton*[3]

[1] "Iowa plants have plan to offer farmers cash in exchange for corn cobs", http://lubbockonline.com/stories/071909/bus_465634705.shtm

[2] Eastern PA mulch hay price, PA Dept of Ag July 6th Data, Lancaster Farming 7/11/09

3 Oops, I need to point out these weren't farm gate prices, for more accuracy we would have to subtract hauling as well!

Biomass Math, Simple Second Year Calculation[1]

- $50.00 per ton establishment
- $19.00 per ton fertilizer, herbicide, lime[2]
- $8.50 per ton harvest cost
- $13.75 per ton land rent cost[3]

+ $45.00 per ton sale price

- $46.25 per ton net loss!

[1] No revenue first year. No allocation for equipment depreciation, taxes, etc.

[2] Lime $15/acre, Fertilizer $40/acre, Herbicide $20/acre, Soil Test $1/acre assuming 4 tons yield/acre (Converted from Curran and Roth, 2007)

[3] $55 per acre USDA '08 PA cash rent average value divided by 4 tons per acre. (USDA Agricultural Land Values and Cash Rents Final Estimates 2004-2008 http://www.usda.gov/nass/PUBS/TODAYRPT/landsb09.pdf)

Biomass Math, Simple Ten Year Calculation[1]

- $5.00 per ton establishment[2]
- $19.00 per ton fertilizer, herbicide, lime[3]
- $8.50 per ton harvest cost
- $13.75 per ton land rent cost[4]

+ $45.00 per ton sale price

- $1.25 per ton net loss!

[1] Years two - ten. No allocation for equipment depreciation, taxes, etc.

[2] Remember, switchgrass is a perennial! Establishment costs amortized across ten years.

[3] Lime $15/acre, Fertilizer $40/acre, Herbicide $20/acre, Soil Test $1/acre assuming 4 tons yield/acre (Converted from Curran and Roth, 2007)

[4] $55 per acre USDA '08 PA cash rent average value divided by 4 tons per acre. (USDA Agricultural Land Values and Cash Rents Final Estimates 2004-2008 http://www.usda.gov/nass/PUBS/TODAYRPT/landsb09.pdf)

Biomass's Financial Challenges

- No first year revenue
  - Most crops take at least two if not three years until they attain full growth potential
  - But establishment costs can be amortized (carried) across a long period of time
- Low price paid per ton
  - Competing with low cost byproducts

Subsidies are a necessity to support the nascent biomass business!

- Let's talk about a few programs…

Biomass Crop Assistance Program - BCAP

FSA BIOMASS CROP ASSISTANCE PROGRAM

Biomass Crop Assistance Program - BCAP

- Intended to help establish biomass crops.
  - New 2008 Farm Bill program administered by FSA
  - May '09 "Presidential Directive to USDA to Expand Access to Biofuels" expediting efforts
  - Notice Of Funding Availability (NOFA) out June 11th [1]
- Provides 1 to 1 matching payments for the collection, harvest, storage and, transportation (CHST) of biomass material
  - Payments up to $45 per ton

[1] http://farmenergy.org/wp-content/uploads/2009/06/bcap-official-chst-nofa-2009.pdf

Biomass Crop Assistance Program - BCAP

- BCAP is not a producer only program, material must be delivered to a qualified biomass conversion facility (BCF)
- Producers work with local FSA office before sale to determine eligibility, and after sale for receipt verification and reimbursement
- Five year contracts available for annual and perennial crops, 15 years for woody biomass
- Conservation practices will be required
- Up to 75% of planting costs will be reimbursed once full program is implemented
- BCAP "Project Areas" will be selected

Biomass Crop Assistance Program - BCAP

- Qualified Biomass Conversion Facility (BCF)
  - "Facility that converts or proposes to convert eligible material into:
    - Heat
    - Power
    - Biobased products
    - Advanced biofuels"
  - "The facility must be an entirely separate legal entity from owners of eligible material who conduct purchases of eligible material from the owners for biomass acquisition using arms-length transactions"

Biomass Crop Assistance Program - BCAP

- Qualified Biomass Conversion Facility (BCF)
  - Signs a Memorandum Of Understanding and is then added to a national list of CHST eligible BCFs.
    - Agrees to purchase biomass on a $ to $ dry ton basis
    - "Purchase List" required for BCF
- Excellent BCAP webinar at:
  http://minnesotaproject.wordpress.com/2009/07/14/biomass-crop-assistance-program-webinar-video-audio-presentations/

Environmental Quality Incentives Program- EQIP

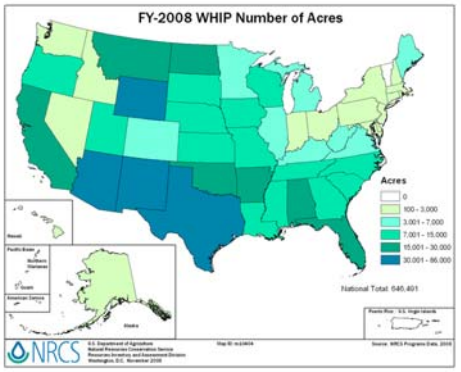
- Financial assistance to help producers establish diverse native grasslands for high quality wildlife habitat, forage, and biomass production.
  - The Establishment Incentive for grasslands is a one-time flat rate reimbursement of either $165, $210 or $275 per acre depending on seeding.
    - The incentive payment covers seed costs, site preparation, seeding, and follow up weed control during the first year.
  - Management Incentives are available for producers who wish to manage their grasslands for maximum wildlife benefit. These payments are paid once per year for up to three years after the seeding year.
    - $175 per acre per year available to producers to leave fields un-harvested, or $85 when harvest time frames minimize habitat disturbance during their contract periods.
  - Agricultural producers are eligible, at least $1000 of agricultural products produced and sold on the farm

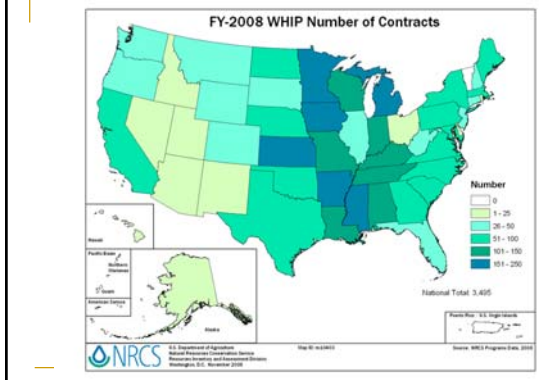
From: www.pa.nrcs.usda.gov/programs/eqip/EQIPWILDLIFE.pdf

Wildlife Habitat Incentive Program - WHIP

- Voluntary program for conservation-minded landowners who want to develop and improve wildlife habitat on agricultural land, nonindustrial private forest land, and Indian land.
- Provides technical assistance and up to 75 percent cost-share assistance to establish and improve fish and wildlife habitat.
- Agreements last from one year after the last conservation practice is implemented, but not more than 10 years from the date the agreement is signed.

Source: http://www.nrcs.usda.gov/programs/whip/





State	2008 Acres	2008 Contracts	Acres/Contract	Obligated	Obligated/Acre	Obligated/Contract	Unfunded	Funded/Unfunded
ALASKA	157	7	22.4	$537,387	$3,423	$76,770	$844,465	0.6
ARIZONA	68,251	18	3791.7	$1,746,665	$26	$97,037	$1,455,554	1.2
ARKANSAS	21,600	167	129.3	$1,673,335	$77	$10,020	$210,419	8.0
CALIFORNIA	17,140	51	336.1	$2,781,276	$162	$54,535	$3,163,020	0.9
COLORADO	3,727	33	112.9	$812,106	$218	$24,609	$172,265	4.7
CONNECTICUT	822	50	16.4	$1,604,508	$1,952	$32,090	$1,058,975	1.5
DELAWARE	437	23	19.0	$356,913	$817	$15,518	$0	#DIV/0!
FLORIDA	21,692	36	602.6	$666,357	$31	$18,510	$1,443,774	0.5
GEORGIA	9,475	93	101.9	$727,676	$77	$7,824	$297,330	2.4
HAWAII	473	3	157.7	$581,241	$1,229	$193,747	$968,735	0.6
IDAHO	892	15	59.5	$1,553,623	$1,742	$103,575	$3,003,671	0.5
ILLINOIS	3,694	47	78.6	$1,560,066	$422	$33,193	$265,543	5.9
INDIANA	2,493	111	22.5	$1,275,637	$512	$11,492	$379,243	3.4
IOWA	8,667	206	42.1	$1,380,534	$159	$6,702	$455,710	3.0
KANSAS	13,719	151	90.9	$820,796	$60	$5,436	$10,871	75.5
KENTUCKY	6,843	131	52.2	$1,492,528	$218	$11,393	$965,895	1.7
LOUISIANA	9,265	126	73.5	$1,137,656	$123	$9,029	$225,726	5.0
MAINE	5,341	54	98.9	$1,426,203	$267	$26,411	$381,643	3.9
MARYLAND	429	71	6.0	$926,819	$2,160	$13,054	$221,914	4.2
NEW JERSEY	2,491	31	80.4	$1,135,298	$456	$36,623	$0	#DIV/0!
NEW MEXICO	85,602	25	3424.1	$625,665	$7	$25,027	$60,053	12.5
NEW YORK	2,206	63	35.0	$991,221	$449	$15,734	$818,151	1.2
NORTH CAROLINA	12,561	52	241.6	$1,117,812	$89	$21,496	$472,921	2.4
NORTH DAKOTA	21,943	96	228.6	$1,064,398	$49	$11,087	$177,400	6.0
OHIO	1,834	18	101.9	$705,821	$385	$39,212	$548,972	1.3
OKLAHOMA	28,418	80	355.2	$1,009,850	$36	$12,623	$4,367,600	0.2
OREGON	14,855	34	436.9	$1,037,528	$70	$30,516	$518,764	2.0
PENNSYLVANIA	2,586	77	33.6	$884,087	$342	$11,482	$493,711	1.8
RHODE ISLAND	208	5	41.6	$930,157	$4,472	$186,031	$3,348,565	0.3
SOUTH CAROLINA	9,432	51	184.9	$1,332,784	$141	$26,133	$601,059	2.2
SOUTH DAKOTA	11,610	47	247.0	$935,274	$81	$19,899	$298,492	3.1
TENNESSEE	12,861	145	88.7	$1,080,899	$82	$7,317	$314,611	3.4
TEXAS	58,867	62	949.5	$1,756,215	$30	$28,326	$169,956	10.3
UTAH	8,098	9	899.8	$1,596,074	$197	$177,342	$4,965,565	0.3
VERMONT	0		#DIV/0!		#DIV/0!	#DIV/0!	$663,261	0.0
VIRGINIA	4,444	67	66.3	$1,535,543	$346	$22,919	$252,104	6.1
WASHINGTON	1,154	31	37.2	$626,930	$543	$20,224	$242,880	2.6
WEST VIRGINIA	5,460	34	160.6	$470,687	$86	$13,844	$1,232,093	0.4
WISCONSIN	11,005	124	88.8	$2,059,284	$187	$16,607	$1,262,142	1.6
WYOMING	72,854	37	1968.0	$1,078,001	$15	$29,135	$1,081,517	1.0
TOTAL	646,491	3,495	185.0	$57,221,029	$89	$16,372	$40,555,373	2.1

Analysis of WHIP Data at:
http://www.nrcs.usda.gov/programs/whip/FY08contract_info/whipfy08contractinfo.html

Other Possible USDA Programs
(Depending on Circumstances)

- Agricultural Management Assistance (AMA)
- Wetlands Reserve Program (WRP)
- Conservation Reserve Program (CRP)
  - With waivers or policy change!
- Conservation Innovation Grants (CIG)
  - Example: PSU Camelina Project
  - Maximum grant = $75,000. CIG will pay up to 50 percent of the cost of the proposed project and at least 50 percent of the total project cost must come from non-federal matching funds (cash and in-kind contributions) provided by the grantee.

Chesapeake Bay Watershed Initiative

- Incentives for:
  - Erosion and Sediment Control
  - Nutrient Loss Reduction
  - Corridor Protection
- Unfortunately you can't "stack" all these USDA programs!

US Fish & Wildlife Service

- Wildlife habitat and riparian buffer programs
  - Implementation assistance
    - No-till grass drill, other machinery
  - Partner with Pheasants Forever on some projects
    - Will be very interested in managing time of harvest
- *Office right here in State College!*

Resource Enhancement and Protection Program (REAP) - PA

- Tax credits for **75%** of eligible costs include the following:
  - Nutrient Management Plan, Ag. E&S Plan and/or Conservation Plan development.
  - BMPs for ACAs and barnyard runoff, stream bank fencing with 50 foot forested riparian buffers, and 50 foot forested riparian buffers. ***(Willows?)***
- 2. Tax credits for **50%** of eligible costs include:
  - Any Commission approved BMP or equipment necessary to reduce existing sediment and nutrient concerns, such as: manure storage systems, alternative manure treatment practices, filter strips, grassed waterways, management intensive grazing systems and **no till planting equipment**.
  - Stream bank fencing with 35 foot riparian buffers (grassed or forested).

http://www.agriculture.state.pa.us/agriculture/cwp/view.asp?a=3&q=145155

Proposed Pennsylvania Programs

- Senate Bill 698, Pennsylvania Farms To Fuels Initiative Act
  - "The purpose of the program is to encourage the production of those bioenergy crops approved by the Secretary of Agriculture, which will both preserve the soil, air and water of this Commonwealth and serve as the basic material for production of cellulosic ethanol."
  - $10m to Dept of Agriculture
  - "For each acre of growing land upon which a bioenergy crop is harvested, a farmer shall receive a bioenergy crop transition incentive payment of $150 for the first year's harvest, $100 for the second year's harvest and $50 for the third year's harvest. No participant may receive more than $100,000 in the aggregate."
- Lead Sponsor – Senator Michael Waugh, York County (Vice Chair Ag Committee)

Proposed Pennsylvania Programs

- House Bill 136, Amendment to the Surface Mining Conservation and Reclamation Act
  - "To the extent consistent with this act, the department shall encourage and promote the use of switchgrass and other bioenergy crops for the revegetation of lands affected by surface mining activities and the land so used shall be considered to be cropland for post-mining land use purposes."
  - "Bioenergy Crop Bonding…for the conservation purpose of providing sum-certain financial guarantees needed to facilitate the implementation…the department shall make available at no cost to the surface mine permittee of a remining site that has revegetated the remining site with switchgrass or other bioenergy crops sum-certain guarantees to cover Stage III reclamation liability…"
- Lead Sponsor – Representative Michele Brooks, Portions of Crawford, Lawrence, and Mercer Counties

Carbon Credits

- Carbon Credit revenue can be received for multi-year commitment to no-till practices as often used to establish warm season grasses
  - Revenue per metric ton of carbon left undisturbed (sequestered) in the soil.
  - Generally .6 to 1 metric ton/acre/year
  - Currently $.60 per metric ton on Chicago Climate Exchange as of 7/13/09[1]
    - Some project much higher future value, perhaps as much as $50 per metric ton[2]
    - European Exchange at $20.25 as of 7/13/09[1]

[1] www.chicagoclimatex.com

[2] www.25x25.org/storage/25x25/documents/Carbon_Subcommittee/carbon_primer_exec_summ_03-23-09_final_rev.pdf

Carbon Credits

- Entities with existing farm land oriented carbon credit programs
  - Pennsylvania Farm Bureau - Global Emissions Exchange (GEX) pilot program in Armstrong, Beaver, Berks, Centre, Chester, Columbia, Franklin and Lycoming counties.
    - Three year term
  - National Farmers Union, most of central Pennsylvania
    - Five year term

Sources: http://www.pfb.com/news/ag-issues/Full-GEX-instructions-4-09.pdf

http://nfu.org/issues/environment/carbon-credits

Conclusion

- It's practically impossible to raise a biomass energy crop without going cash negative for at least the first few years
- There are federal, state, and commercial programs that may help make up the difference
  - Take the time to research the rules for each program
  - Some programs require collaboration with end users and other growers, let's get to it!

Extra content….

Conservation Reserve Program - CRP

- Annual rental payments and cost-share assistance to establish long-term, resource conserving covers on eligible farmland
- Eligible Land
  - Cropland (including field margins) that is planted or considered planted to an agricultural commodity 4 of the previous 6 crop years from 1996 to 2001, and which is physically and legally capable of being planted in a normal manner to an agricultural commodity; or
  - Certain marginal pastureland that is suitable for use as a riparian buffer or for similar water quality purposes.
- 10 to 15 year duration
- Harvest Limitations
  - Typically no mowing allowed from April - July
    - Probably not the best time to harvest biomass anyhow.
  - Generally only a rotating portion of contracted area maybe mowed.

More at: http://www.pa.nrcs.usda.gov/

	Contracts	Farms	Acres	Payments	Payments/Contract	Payments/Farm	Payments/Acre
ALABAMA	10,135	7,281	463,169	$21,023,633	$2,074	$2,887	$45
ALASKA	59	39	26,468	$924,536	$15,670	$23,706	$35
ARKANSAS	5,639	3,121	236,311	$12,701,754	$2,252	$4,070	$54
CALIFORNIA	537	417	132,836	$4,678,601	$8,712	$11,220	$35
COLORADO	13,755	6,522	2,430,311	$78,475,864	$5,705	$12,032	$32
CONNECTICUT	20	18	188	$13,122	$656	$729	$70
DELAWARE	751	393	7,807	$825,276	$1,099	$2,100	$106
FLORIDA	1,609	1,304	70,017	$2,734,512	$1,700	$2,097	$39
GEORGIA	9,114	6,655	328,638	$14,088,427	$1,546	$2,117	$43
IDAHO	5,831	3,343	774,485	$32,366,449	$5,551	$9,682	$42
ILLINOIS	79,451	44,126	1,063,687	$113,007,185	$1,422	$2,561	$106
INDIANA	36,401	21,181	295,354	$28,784,038	$791	$1,359	$97
IOWA	106,530	53,739	1,815,949	$201,954,095	$1,896	$3,758	$111
KANSAS	49,874	28,431	3,124,702	$123,334,516	$2,473	$4,338	$39
KENTUCKY	17,906	9,866	386,294	$37,918,862	$2,118	$3,843	$98
LOUISIANA	4,629	3,027	304,527	$16,250,772	$3,511	$5,369	$53
MAINE	821	547	20,802	$1,047,408	$1,276	$1,915	$50
MARYLAND	6,594	3,580	83,218	$10,460,856	$1,586	$2,922	$126
MASSACHUSETTS	10	9	55	$5,566	$557	$618	$101
MICHIGAN	16,420	9,573	260,060	$20,644,416	$1,257	$2,157	$79
MINNESOTA	63,094	33,724	1,774,132	$109,921,113	$1,742	$3,259	$62
MISSISSIPPI	20,442	13,084	897,432	$39,941,824	$1,954	$3,053	$45
MISSOURI	36,956	21,664	1,455,034	$101,017,585	$2,733	$4,663	$69
MONTANA	17,258	6,569	3,297,574	$108,818,456	$6,305	$16,565	$33
NEBRASKA	28,987	16,267	1,237,298	$70,781,243	$2,442	$4,351	$57
NEWHAMPSHIRE	11	11	77	$3,974	$361	$361	$52
NEWJERSEY	238	168	2,423	$159,935	$672	$952	$66
NEWMEXICO	2,499	1,581	570,438	$18,707,982	$7,486	$11,833	$33
NEWYORK	3,033	2,166	59,886	$3,795,672	$1,251	$1,752	$63
NORTHCAROLINA	9,074	5,770	131,803	$8,503,071	$937	$1,474	$65
NORTHDAKOTA	35,667	17,482	2,986,950	$101,019,575	$2,832	$5,778	$34
OHIO	36,032	20,633	353,130	$38,660,534	$1,073	$1,874	$109
OKLAHOMA	8,580	5,773	983,867	$32,538,814	$3,792	$5,636	$33
OREGON	4,179	2,201	563,592	$27,903,802	$6,677	$12,678	$50
PENNSYLVANIA	11,989	7,625	229,062	$22,251,547	$1,856	$2,918	$97
PUERTORICO	23	23	2,223	$157,881	$6,864	$6,864	$71
SOUTHCAROLINA	8,693	5,068	194,351	$7,117,867	$819	$1,404	$37
SOUTHDAKOTA	29,855	14,370	1,310,708	$58,581,720	$1,962	$4,077	$45
TENNESSEE	8,089	5,414	235,172	$14,465,903	$1,788	$2,672	$62
TEXAS	24,974	18,132	3,939,770	$139,882,022	$5,601	$7,715	$36
UTAH	1,049	617	194,710	$5,944,905	$5,667	$9,635	$31
VERMONT	283	211	2,266	$215,755	$762	$1,023	$95
VIRGINIA	5,557	4,286	66,138	$3,772,799	$679	$880	$57
WASHINGTON	12,579	5,079	1,538,165	$83,034,658	$6,601	$16,349	$54
WESTVIRGINIA	366	296	4,928	$348,356	$952	$1,177	$71
WISCONSIN	29,654	18,360	526,861	$39,703,788	$1,339	$2,108	$73
WYOMING	1,153	750	277,920	$7,709,211	$6,686	$10,279	$28
NON-REPORTING	4	4	193	$8,464	$1,624	$1,624	$34
Total	786,404	430,500	34,661,059	$1,765,256,374	$2,303	$4,100	$51

Analysis of CRP Data at: http://www.fsa.usda.gov/Internet/FSA_File/enroll.pdf