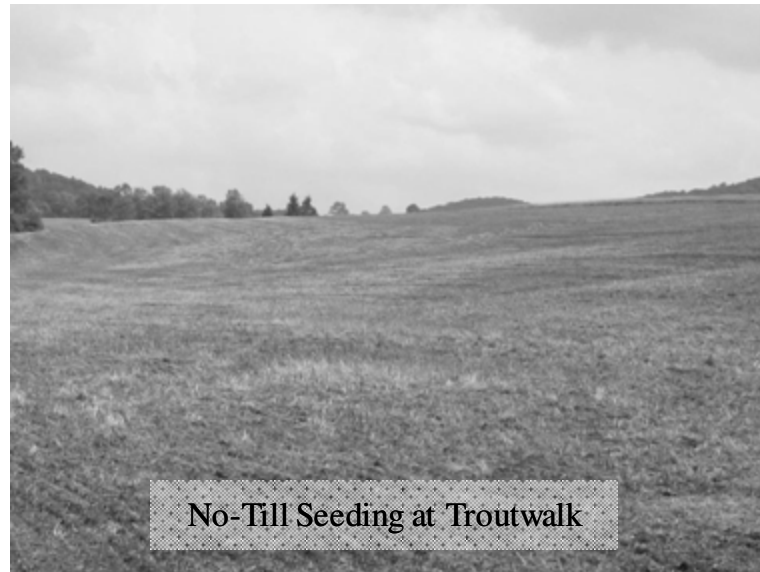


Growing Bio-Fuel Crops
in the
Hudson Valley
CCE Dutchess Co. Trial with NYS
Ag. and Markets funding

Basic Details and Calendar

Conventional Seeding	No-Till seeding
Rocky Reef Farm - 6 ac. Stanfordville - off Rte 82	Trout Walk Farm- 6 ac. Amenia - off S. Amenia Rd.
Initial field prep. <ul style="list-style-type: none"> • May 12th 2006 Round up sprayed • June 1st Completed plowing and discing 	Initial field prep. <ul style="list-style-type: none"> • June 6th 2006 Round up sprayed • June 19th completed bushhogging and light harrowing to expose top-soil
Seeding: June 13th Using a grain drill with a single disc opener and fine seed box Rate: Adjusted to 8 lbs/Ac. live seed	Seeding: June 21st Using a No-Till drill with a fine seed box. Rate: Adjusted to 8 lbs/Ac. live seed
Fertilizing: September 28th 2006 N= 10 lb/ ac P = 45 lb/ ac K = 35 lb/ ac	Fertilizing: September 28th 2006 N= 10 lb/ ac P = 45 lb/ ac K = 35 lb/ ac
Weed control: Bush-hogging weedy strip only: July 28th '06, Sept 1st '06 and June 30th '07 Broadleaf herbicide: May 22nd 2007 on the weedy half.	Weed control: Bush-hogging only: Aug. 17th '06, and June 1st '07 No herbicide other than initial Round-up.



No-Till Seeding at Troutwalk

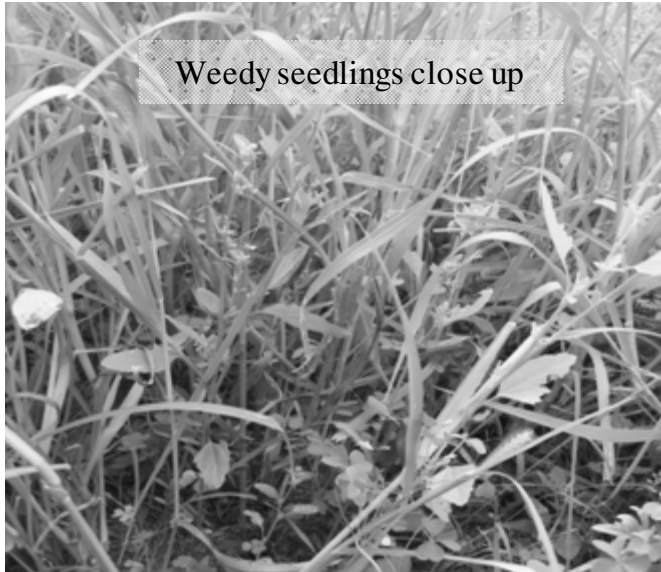


Conventional Seeding at
Rocky Reef



Weedy Start
before Bush-
hogging: July
28th 2006

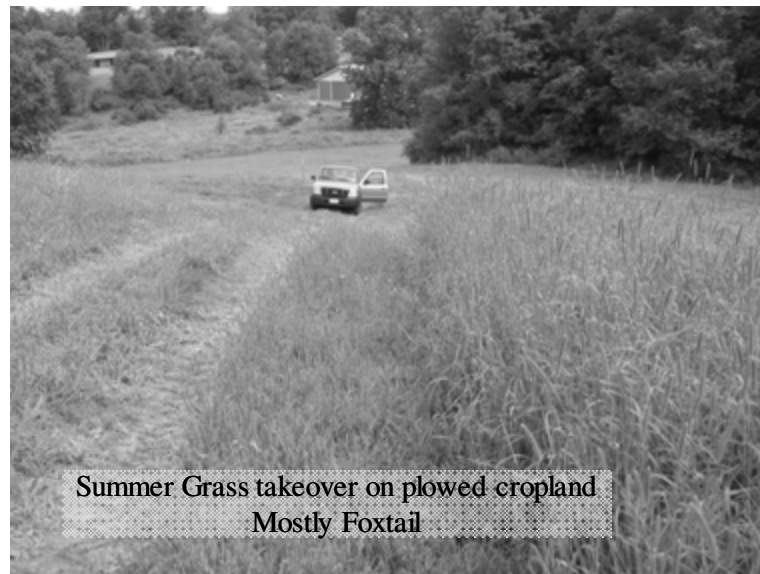
Weedy seedlings close up







Great Start on plowed hay field
September 2006



Summer Grass takeover on plowed cropland
Mostly Foxtail



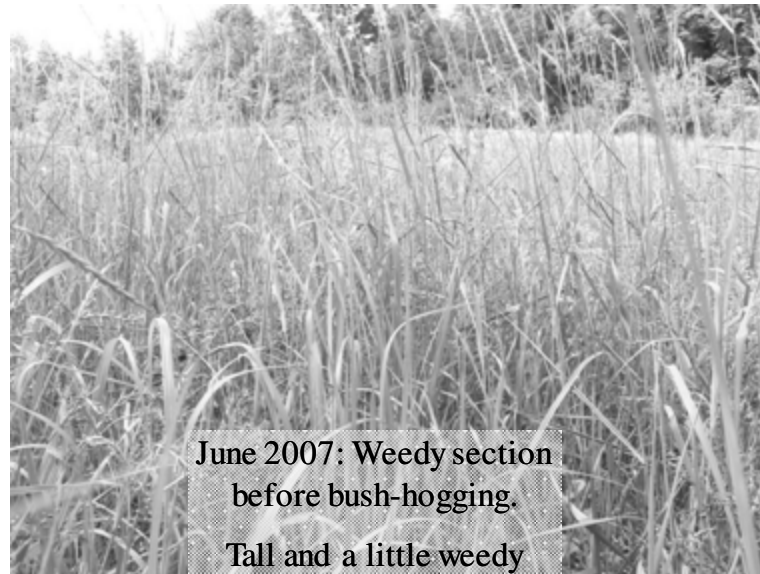
Big flats: USDA Warm Season Grass Trials





Big Flats: Eastern Gamma Grass





June 2007: Weedy section
before bush-hogging.
Tall and a little weedy



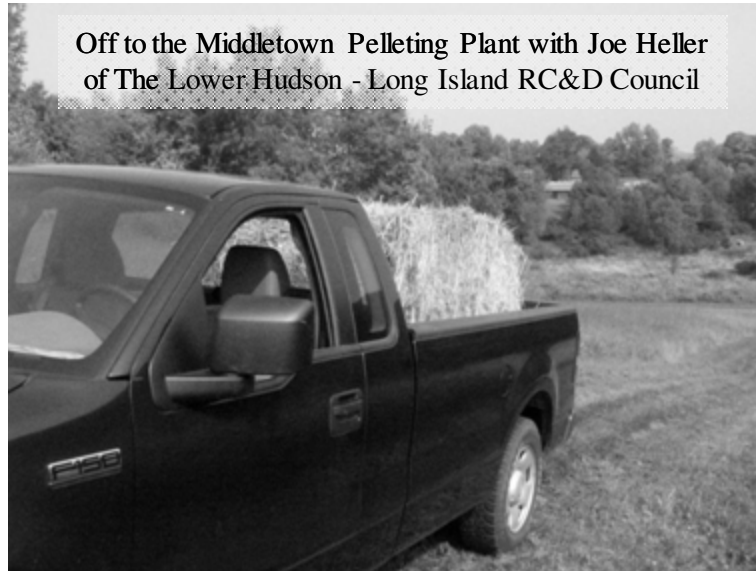
July 10th: Over your shoulder high.





Re-growth: Three weeks later

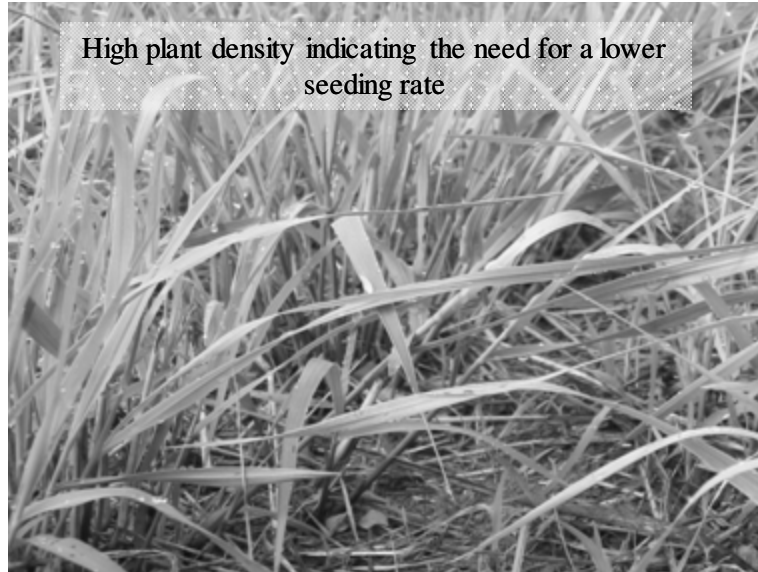
Off to the Middletown Pelleting Plant with Joe Heller
of The Lower Hudson - Long Island RC&D Council



Lessons Learned

- Patience is a virtue. It really only looks good in Yr. 3.
- Field history and preparation make a big difference.
(annual crops = weeds: better = sod or cover crops)
- Warm and moist soils help germination.
- Seeding rate could be lowered to 5 or 6 lbs/ acre.
- Switchgrass does well in August...mow for weeds in late July.
- An effective, labeled herbicide may be needed in the case of heavy weed pressure, but the expense may not be justified.

High plant density indicating the need for a lower seeding rate



Costs of Switchgrass
Establishment
Over two years

Establishment of Switchgrass Trial in Dutchess Co. 2006

Operating inputs	Conventional Tillage		No-Till		
	Rates	Cost per acre	Rates	Cost per acre	
Tillage	Machinery	\$50/hr	\$123.40	\$50/hr	\$33.30
	Labor	\$15/hr	\$37.02	\$15/hr	\$10.00
	Tot.		\$160.42		\$43.30
Seeding	Machinery	\$20/hr	\$10.44	\$20/hr	\$76.92
	Labor	\$15/hr	\$3.13	\$15/hr	\$23.08
	Seed	8 lbs/c	\$80.00	8 lbs/c	\$80.00
Tot.		\$93.57		\$180.00	
Weed control	Herbicide		\$40.24		\$33.90
	Custom		\$38.33		\$30.84
	Application	\$50/hr	\$33.65		\$55.25
	Labor	\$15/hr	\$10.10		\$16.57
Tot.		\$122.29		\$136.56	
Amendments	Lime	None	None	None	None
	Fertilizer	10/45/05 lbs	\$36.62	10/45/05 lbs	\$36.62
	Custom		\$22.00		\$22.00
	Application				
Tot.		\$58.62		\$58.62	
Tot. Operating Inputs		\$454.87		\$418.41	
Fixed costs	Insurance		\$8.00		\$8.00
	Property Taxes		\$12.00		\$12.00
Tot Fixed Costs	Tot.	\$20.00	Tot.	\$20.00	
Total Cost per Acre		\$454.87		\$438.41	

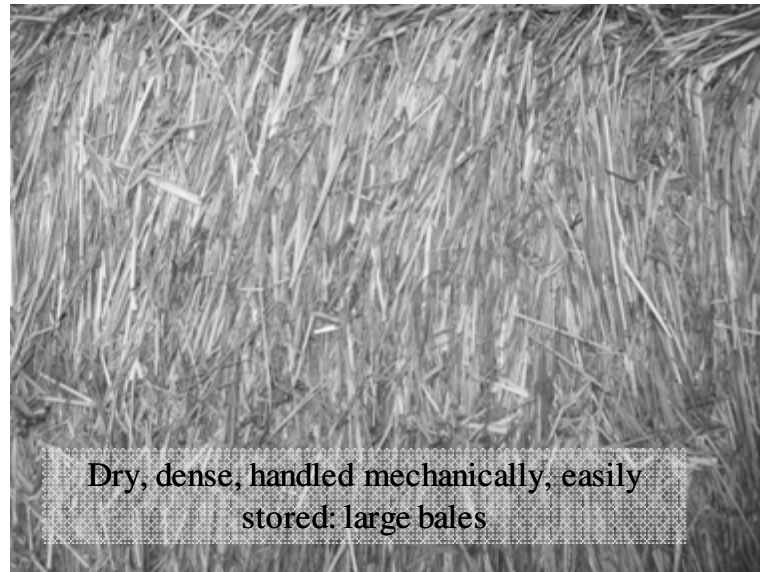
- Note: 1 Liability Insurance as per Monk's Farm Family Agency
- Note: 2 Property taxes averaged between towns of Stanford and Amenia
- Note: 3 Data derived from Dutchess co. Real Property
- Note: 4 No-Till: Minimal discing was required to incorporate excess plant residue which was the result of bushhogging the killed spring hay growth.
- Note: 5 Herbicide calculated for 7 acres: Tot. divided accordingly for cost per acre.
- Note: 6 Conventional: Bushhogged three acres three times
- Note: 7 No-Till: Bushhogged 6 acres twice

Cost of Production of Switchgrass over 15 years

Switchgrass is a long-lived perennial grass with a productive life of at least 15 years. The following calculation assumes that three years are needed for establishment and custom rates for harvest are taken from USDA's Pennsylvania Custom Rates 2007 publication

	Term/ Yrs	Cost/ Acre	Amortized Cost
Establishment	Yr 1& 2	15	\$440.00
			\$29.33
Establishment	Yr 3	15	\$60.00
			\$4.00
Fertilizer	1	\$40.00	\$40.00
Mowing and raking	1	\$34.30	\$34.30
Big Sq. Baling	1	\$85.00	\$85.00
Transport & Storage	1	\$65.00	\$65.00
Fixed Costs	1	\$20.00	\$20.00
Total cost/acre			\$277.63
Farm Gate			
Cost	5 ton/acre	Cost per ton	\$55.53

Acres of Switchgrass needed to qualify for Ag. Value Assessment @ \$80.00 /ton = 25 acres



Dry, dense, handled mechanically, easily
stored: large bales

Will the demand for home heating with grass pellets
justify the investment in a pelleting plant.



Jerry Cherney the E.V. Baker Professor of Agriculture, sits in front of one of three pellet stoves at Cornell's M. Pleasant Research Farm, where he tests different pellets made from grasses as an alternative fuel.
Nicola Kountoupes/University Photography

NYSDERDA Research to Promote High-Efficiency Biomass Heating Technologies

September 30, 2008

Project Partners	Project Title	County	Description
Alternative Fuel Boilers	EcoBurn High-Efficiency Wood Boiler	Chautauque	Project will evaluate energy and environmental performance of residential size wood gasification boiler.
Advanced Climate Technologies (ACT), Cayuga Nature Center, Clarkson University, Cornell University	Commercial Wood Gasification Boiler Demonstration	Schenectady, Tompkins,	Project will evaluate energy and environmental performance of commercial size wood gasification boiler at the Cayuga Nature Center in Ithaca, NY.
Northeast States For Coordinated Air Use Management (NESCAUM)	Emissions Characterization for Small-scale Commercial Wood Boilers.	TBD	Project will evaluate energy and environmental performance of conventional commercial-scale biomass technology. Testing will also be performed on oil-fired boilers for comparison. Results from this study will be compared to high-efficiency wood gasification units.
Clarkson University, A.C.T. New England Wood Pellet	Demonstration and Evaluation of a European Wood Pellet/Solar Boiler System	St. Lawrence	Project will demonstrate an advanced commercial-scale technology and evaluate energy efficiency and emissions. The project will be conducted at Clarkson University's Energy Park.
Cornell University	Performance of Pellet Stoves and Boilers Using Grass Pellets for a Fuel Source	Tompkins	Project will evaluate high- and low- ash content grass-based pellets and mixtures of grass and wood pellets. Project will test the functionality of pellet stoves in managing and removing ash residue from the burn chamber.
SUNY Canton, Cornell University Cooperative Extension	Demonstrations and Field Testing of Combustion Characteristics of Domestic and European Appliances Burning Grass Pellets	St. Lawrence	Project will produce grass pellets and test them in a variety of pellet burning equipment.
U.S. EPA Office of R&D	Environmental Characterization of Outdoor Wood-Fired Hydronic Heaters.	NC	Project will evaluate the energy efficiency and emissions from conventional and advanced residential size wood boilers by EPA methods at the EPA combustion laboratories. Project will also characterize environmental impacts of various wood boiler technologies based of different market scenarios.
Brookhaven National Laboratories	Comparative Study of Efficiency and Emissions for Residential Biomass Heating Options	Suffolk	Project will test energy and emissions performance of outdoor wood boilers, advanced gasification boilers, pellet and wood stoves, and a potential emissions control technology. Project will also coordinate with SUNY Canton and Cornell projects to test the energy efficiency and emissions of stoves and boilers burning grass pellets.
NESCAUM, University of British Columbia	Spatial Modeling and Monitoring of Residential Wood smoke in an Upstate NY region.	TBD	Project will measure the contribution of wood smoke to local air quality during winter stagnation periods.