Perennial Grasses Panel: Miscanthus, Switchgrass, Polycultures – Growing, Harvesting, Storage, Sustainability

Agronomy Forum on Agricultural Biomass for Combustion Energy

Guelph, Ontario

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February 11, 2011

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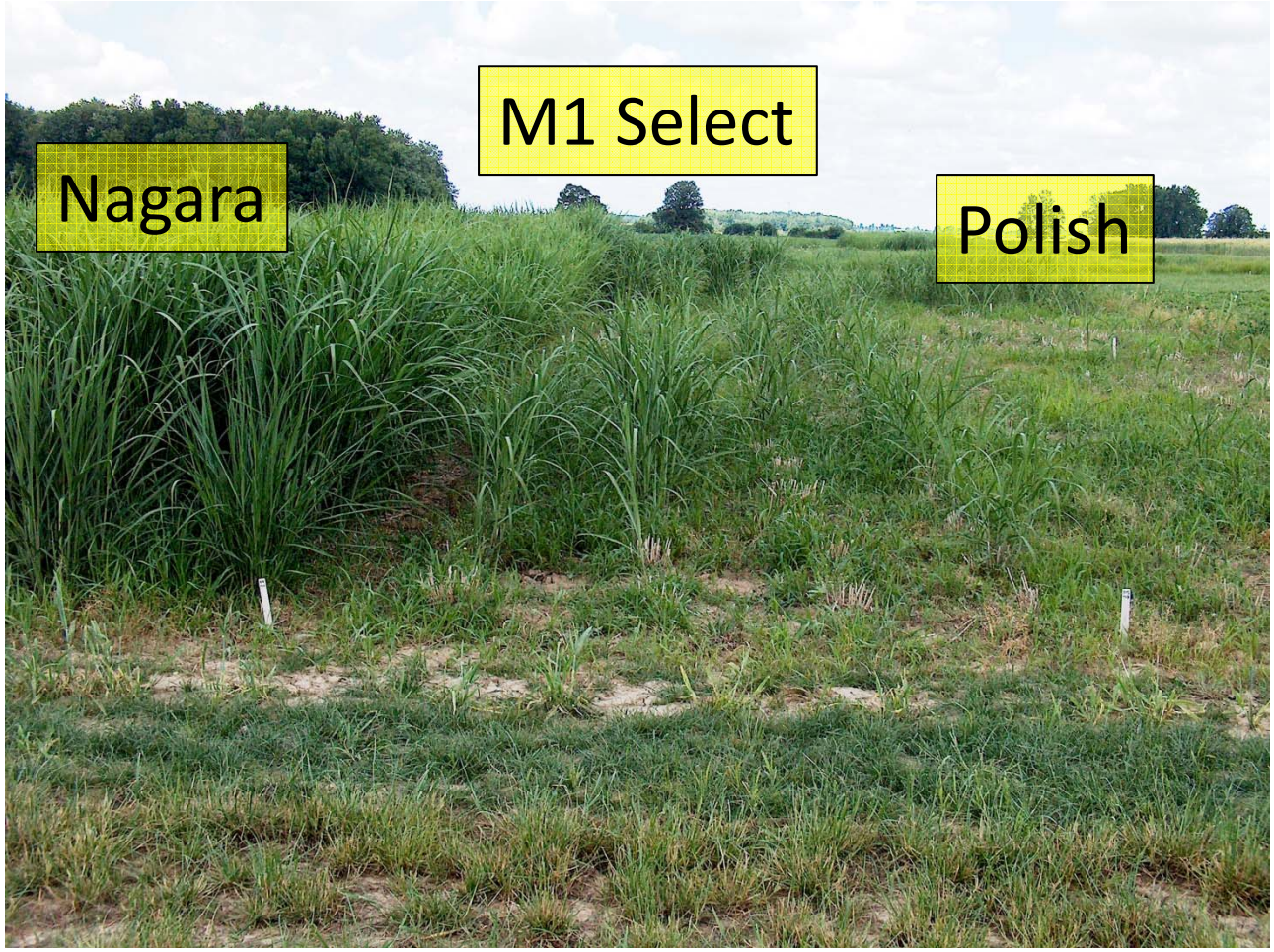
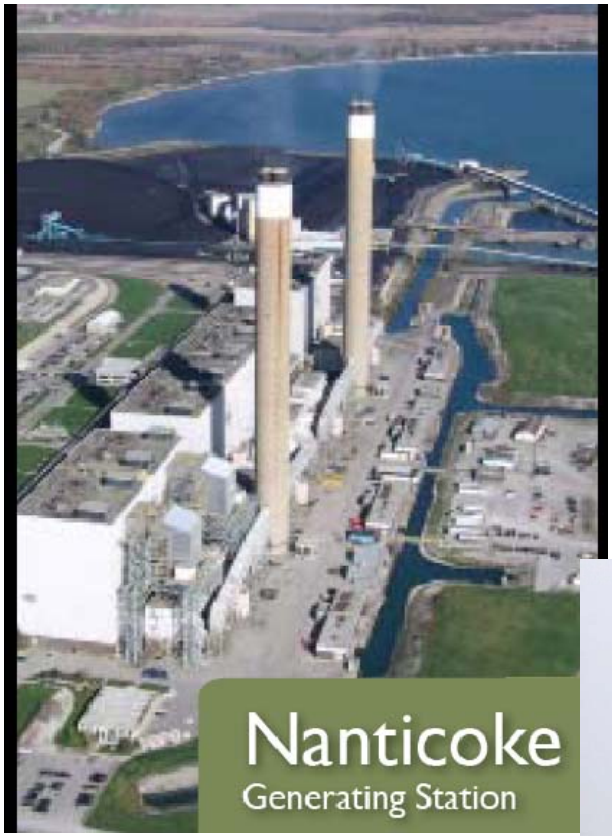
Dedicated Crops - research

- Multi-site perennial grass comparison
  - Deen,Young, Tubeileh, Rowsell, Van Acker: funded by OMAFRA – Alternative Renewable Fuels Program, OMAFRA/U of G, Environmental Sustainability Directed Research Program OMAFRA.
- Perennial grass comparison to poplar and willow
  - Thimmanagari, Gordon , Deen, Thevathasan: funded by Environmental Sustainability Directed Research Program OMAFRA
- Switchgrass/Big Bluestem/Prairie Cordgrass breeding/agronomy
  - Bowley, Deen: funded by Environmental Sustainability Directed Research Program OMAFRA
- Life Cycle Analysis - Miscanthus
  - MacLean, Deen, Dias, McDonald: funded by Ontario Power Generation
- Ontario biomass availability assessment
  - Deen, Weersink, Van Acker, Kludze: funded by OMAFRA/U of G
- Multi-site miscanthus vs switchgrass comparison
  - funded by Energy Bioscience Institute
- Comparison of 26 miscanthus genotypes
  - Deen, Young and Tubeileh: funded by Mendel Biotechnology
- Cold Tolerance Evaluations – Miscanthus
  - Sage, Deen, FIP/AAC
- Weed Control – Perennial grasses
  - Van Acker, O Sullivan, FIP/AAC

Winter survival - 4 miscanthus clonal varieties (hybrids of M. *sinensis* x M. *sacchariflorus*): Nagara, Amuri, M1 Select, Polish

Elora – Established June 2008, images taken June 2009




Nanticoke
Generating Station

Growing Miscanthus/Switchgrass

What we know

- More opportunity compared to agricultural residues
- Varieties available that are adapted to Southwestern Ontario – winter tolerance, lodging (miscanthus)
- Suitable seeding methods for switchgrass
- Plug establishment methods for miscanthus work
- Pre-emergent grass and broadleaf weed control
- Post-emergent broadleaf weed control
- Fertility
- Fall and spring switchgrass and miscanthus yield, moisture, nutrient content, nutrient removal
- Technical aspects of harvesting
- Technical aspects of storing baled material
- Techniques to kill miscanthus and switchgrass
- Low invasiveness potential of miscanthus (sinensis x sachariflorus) and switchgrass
- Soil carbon/soil quality effects

Growing Miscanthus/Switchgrass

What we don’t know/research gaps

- Minor use registrations of herbicides
- Postemergent grass control - particularly C3 perennial grasses
- Transitioning from a sod – is a crop year required?
- Miscanthus propagation method - reduce cost, decrease variability of stand establishment
- Effect of land class and CHU zone on yield (particularly miscanthus)
- Miscanthus/switchgrass establishment, harvest and yield on poorly drained, cold soils
- Technical aspects of storing undensified material
- Alternative uses – livestock bedding, livestock feed, anaerobic digestion
- Effect of harvest timing on moisture, yield and winter survival
- Polycultures
- Variety development / enhancing miscanthus genetic diversity
- Monitor susceptibility to disease and insects
- Combustion demonstrations - collect data, test a range of materials
- Financing options
- Policy/program development

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